Planktic foraminifer and coccolith contribution to carbonate export fluxes over the central Kerguelen Plateau

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Mots-clés	Carbonate counter-pump [7], coccoliths [8], Export [9], Foraminifer [10], Kerguelen Plateau [11], Southern Ocean [12]
Résumé en anglais	We report the contribution of planktic foraminifers and coccoliths to the particulate inorganic carbon (PIC) export fluxes collected over an annual cycle (October 2011/September 2012) on the central Kerguelen Plateau in the Antarctic Zone (AAZ) south of the Polar Front (PF). The seasonality of PIC flux was decoupled from surface chlorophyll a concentration and particulate organic carbon (POC) fluxes and was characterized by a late summer (February) maximum. This peak was concomitant with the highest satellite-derived sea surface PIC and corresponded to a Emiliania huxleyi coccoliths export event that accounted for 85% of the annual PIC export. The foraminifer contribution to the annual PIC flux was much lower (15%) and dominated by Turborotalita quinqueloba and Neogloboquadrina pachyderma. Foraminifer export fluxes were closely related to the surface chlorophyll a concentration, suggesting food availability as an important factor regulating the foraminifer's biomass. We compared size-normalized test weight (SNW) of the foraminifers with previously published SNW from the Crozet Islands using the same methodology and found no significant difference in SNW between sites for a given species. However, the SNW was significantly species-specific with a threefold increase from T. quinqueloba to Globigerina bulloides. The annual PIC:POC molar ratio of 0.07 was close to the mean ratio for the global ocean and lead to a low carbonate counter pump effect (~5%) compared to a previous study north of the PF (6–32%). We suggest that lowers counter pump effect south of the PF despite similar productivity levels is due to a dominance of coccoliths in the PIC fluxes and a difference in the foraminifers species assemblage with a predominance of polar species with lower SNW.

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